

IN THE CLAIMS

1. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:
 - (a) a chamber; and
 - (b) a high capacity pump adjacent to the chamber, the pump having an inlet connected to the chamber to rapidly evacuate gas in the chamber and an outlet that exhausts the evacuated gas to atmospheric pressure, the pump being substantially absent a foreline between the inlet of the pump and the chamber, the pump having an operational rotational speed of not more than 12,000 rpm.
2. (Currently Amended) An apparatus according to claim 1 further comprising a foreline extending between the inlet of the pump and the chamber, the foreline having a length of less than about $[[3]] \underline{2}$ m.
3. (Original) An apparatus according to claim 2 wherein the foreline comprises a diameter of less than about 80 mm.
4. (Canceled)
5. (Currently Amended) ~~An apparatus according to claim 1 wherein the~~ for processing a substrate, the apparatus comprising:
 - (a) a chamber; and
 - (b) a high capacity pump $[[is]]$ abutting the chamber, the pump having an inlet connected to the chamber to rapidly evacuate gas in the chamber and an outlet that exhausts the evacuated gas to atmospheric pressure.
6. (Original) An apparatus according to claim 1 wherein the pump comprises a pre-vacuum pump or a low vacuum pump.

7. (Previously Presented) An apparatus according to claim 1 further comprising a pressure controller to control the pressure of the gas in the chamber by adjusting a speed of the pump.

8. (Original) An apparatus according to claim 1 wherein the chamber comprises a load-lock chamber, transfer chamber or process chamber.

9. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

- (a) a load-lock chamber comprising an enclosure; and
- (b) a pump adjacent the load-lock chamber, the pump having an inlet connected directly to the load-lock chamber to rapidly evacuate gas from the load-lock chamber, the inlet being connected to the load-lock chamber and substantially absent a foreline, and an outlet that exhausts the gas to atmospheric pressure, ~~the pump having an operational rotational speed of not more than 12,000 rpm.~~

10. (Canceled)

11. (Currently Amended) An apparatus according to claim 9 further comprising a foreline extending between the inlet of the pump and the load-lock chamber, the foreline having a length of less than about ~~[[3]]~~2 m.

12. (Original) An apparatus according to claim 11 wherein the foreline comprises a diameter of less than about 80 mm.

13. (Currently Amended) ~~An apparatus according to claim 1 wherein the~~ for processing a substrate, the apparatus comprising:

- (a) a load-lock chamber comprising an enclosure; and

(b) a pump [[is]] abutting [[the]] load-lock chamber, the pump having an inlet connected directly to the load-lock chamber to rapidly evacuate gas from the load-lock chamber and an outlet that exhausts the gas to atmospheric pressure.

14. (Original) An apparatus according to claim 9 wherein the pump comprises a pre-vacuum pump or a low vacuum pump.

15. (Previously Presented) An apparatus according to claim 9 further comprising a pressure controller to control the pressure of the gas in the load-lock chamber by adjusting a speed of the pump.

16. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

(a) a process chamber comprising a support and a gas distributor; and

(b) a high capacity pumping system comprising a pre-vacuum pump adjacent to the process chamber, the pre-vacuum pump having an inlet connected to the process chamber to evacuate gas from the process chamber and an outlet that exhausts the evacuated process gas to atmospheric pressure, the pump being substantially absent a foreline between the inlet of the pump and the chamber ~~having an operational rotational speed of not more than 12,000 rpm~~, whereby a substrate held on the support is processed by process gas introduced through the gas distributor into the process chamber.

17. (Original) An apparatus according to claim 16 further comprising a high vacuum pump having an inlet connected to the process chamber and an outlet that exhausts to the pre-vacuum pump.

18. (Original) An apparatus according to claim 17 wherein the pre-vacuum pump is capable of evacuating the process chamber from about atmospheric pressure to less

than about 0.1 Torr, and the high vacuum pump is capable of evacuating the process chamber from about 0.1 Torr to less than about 10^{-9} Torr.

19. (Currently Amended) An apparatus according to claim 16 further comprising a foreline extending between the inlet of the pre-vacuum pump and the process chamber, the foreline having a length of less than about ~~[[3]]~~2 m.

20. (Original) An apparatus according to claim 19 wherein the foreline comprises a diameter of less than about 80 mm.

21. (Canceled)

22. (Currently Amended) ~~An apparatus according to claim 16 wherein the~~ for processing a substrate, the apparatus comprising:

(a) a process chamber comprising a support and a gas distributor; and

(b) a high capacity pumping system comprising a pre-vacuum pump [[is]] abutting the process chamber, the pre-vacuum pump having an inlet connected to the process chamber to evacuate gas from the process chamber and an outlet that exhausts the evacuated process gas to atmospheric pressure, whereby a substrate held on the support is processed by process gas introduced through the gas distributor into the process chamber.

23. (Previously Presented) An apparatus according to claim 16 further comprising a pressure controller to control the pressure of the process gas in the process chamber by adjusting a speed of the pre-vacuum pump.

24. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising a chamber, a pump capable of operating at different speeds, the pump being substantially absent a foreline between the inlet of the pump and the chamber, a pump controller to control the speed of the pump, and a pressure controller to control a

gas pressure of a gas in the chamber by providing a signal in relation to the gas pressure to the pump controller that changes the speed of the pump in relation to the signal from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate.

25. (Original) An apparatus according to claim 24 wherein the pump controller changes a rotational speed of the pump.

26. (Original) An apparatus according to claim 24 wherein the pump controller changes a speed of an evacuating member of the pump.

27. (Original) An apparatus according to claim 24 wherein the pump comprises a pre-vacuum pump or a low vacuum pump.

28. (Canceled)

29. (Original) An apparatus according to claim 24 wherein a foreline extending between the pump and the chamber comprises a length of less than about 2 m.

30. (Currently Amended) An apparatus according to claim 24 wherein the for processing a substrate, the apparatus comprising a chamber, a pump [[is]] abutting the chamber and capable of operating at different speeds, a pump controller to control the speed of the pump, and a pressure controller to control a gas pressure of a gas in the chamber by providing a signal in relation to the gas pressure to the pump controller that changes the speed of the pump in relation to the signal from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate.

31-37. (Canceled)

38. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising a pump having a plurality of inlet ports, a first inlet port provided to evacuate gas from a first chamber or first pump, and a second inlet port provided to evacuate gas from a second chamber or second pump, the inlet ports being connected directly to the chambers or first and second pumps substantially without forelines.

39. (Original) An apparatus according to claim 38 wherein the first inlet port is connected to the first chamber and the second inlet port is connected to the second chamber.

40. (Original) An apparatus according to claim 38 wherein the first and second inlet ports are connected to one or more inlet stages of the pump.

41. (Currently Amended) An apparatus according to claim ~~[[38]]~~ 40 wherein the inlet stages are connected to other stages of the pump in a parallel arrangement.

42. (Currently Amended) ~~An apparatus according to claim 38 wherein~~ for processing a substrate, the apparatus comprising a pump having a plurality of inlet ports, a first inlet port provided to evacuate gas from a first chamber or first pump, and a second inlet port provided to evacuate gas from a second chamber or second pump, the pump ~~[[abuts]]~~ abutting at least one of the chambers.

43. (Original) An apparatus according to claim 38 wherein the pump comprises an outlet that exhausts the evacuated gas to atmospheric pressure.

44. (Original) An apparatus according to claim 38 further comprising forelines that extend between the inlets ports and the chambers or other pumps, the forelines each having a length of less than about 2 m.

45. (Canceled)

46. (Original) An apparatus according to claim 38 wherein the pump comprises a pre-vacuum pump or a low vacuum pump.

47. (Previously Presented) An apparatus according to claim 38 further comprising a pressure controller to control the pressure of gas in the chambers by adjusting a speed of the pump.

48. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising a multiple inlet pump having a first inlet port in a first inlet stage, and a second inlet port in a second inlet stage, the first inlet port provided to evacuate gas from a first chamber or first pump, and a second inlet port provided to evacuate gas from a second chamber or second pump, the inlet ports being connected directly to the chambers or first and second pumps substantially without forelines.

49. (Original) An apparatus according to claim 48 wherein the first inlet port is connected to the first chamber and the second inlet port is connected to the second chamber.

50. (Currently Amended) ~~An apparatus according to claim 48 wherein~~ for processing a substrate, the apparatus comprising a multiple inlet pump having a first inlet port in a first inlet stage, and a second inlet port in a second inlet stage, the first inlet port provided to evacuate gas from a first chamber or first pump, and a second inlet port provided to evacuate gas from a second chamber or second pump, the multiple inlet pump ~~[[abuts]]~~ abutting at least one of the chambers.

51. (Original) An apparatus according to claim 48 wherein the multiple inlet pump comprises an outlet that exhausts the evacuated gas to atmospheric pressure.

52. (Original) An apparatus according to claim 48 further comprising forelines that each have a length of less than about 2 m.

53. (Canceled)

54. (Original) An apparatus according to claim 48 wherein the multiple inlet pump comprises a pre-vacuum pump or a low vacuum pump.

55. (Previously Presented) An apparatus according to claim 48 further comprising a pressure controller to control the pressure of gas in the chambers by adjusting a speed of the pump.

56. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

(a) a plurality of chambers that are shaped and sized to hold one or more substrates; and

(b) a pump having a first inlet port in a first inlet stage, and a second inlet port in a second inlet stage, the first inlet port provided to evacuate gas from one chamber and a second inlet port provided to evacuate gas from another chamber, at least one of the inlet ports being connected directly to the chambers substantially without a foreline.

57. (Original) An apparatus according to claim 56 wherein the plurality of chambers are mounted on a single platform, and the pump abuts the platform.

58. (Original) An apparatus according to claim 56 wherein the first inlet port is connected to a first chamber and the second inlet port is connected to a second chamber.

59. (Currently Amended) ~~An apparatus according to claim 56 wherein~~ for processing a substrate, the apparatus comprising:

(a) a plurality of chambers that are shaped and sized to hold one or more substrates; and

(b) a pump having a first inlet port in a first inlet stage, and a second inlet port in a second inlet stage, the first inlet port provided to evacuate gas from one chamber and a second inlet port provided to evacuate gas from another chamber, the pump ~~[[abuts]]~~ abutting at least one of the chambers.

60. (Original) An apparatus according to claim 56 wherein the pump comprises an outlet that exhausts the evacuated gas to atmospheric pressure.

61. (Original) An apparatus according to claim 56 further comprising forelines extending between the inlet ports and the chambers, the forelines each having a length of less than about 2 m.

62. (Canceled)

63. (Original) An apparatus according to claim 56 wherein the pump comprises a pre-vacuum pump or a low vacuum pump.

64. (Previously Presented) An apparatus according to claim 56 further comprising a pressure controller to control the pressure of gas in the chambers by adjusting a speed of the pump.

65. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

(a) a chamber capable of holding a substrate and processing the substrate in a gas;

(b) a pump capable of evacuating a gas from the chamber, the pump being substantially absent a foreline between the inlet of the pump and the chamber and capable of changing its speed; and

(c) a pump controller adapted to provide a signal to the pump to vary the speed of the pump from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate to control the rates of evacuation of the gas in the chamber to reduce condensation of moisture in the chamber.

66. (Previously Presented) An apparatus according to claim 65 wherein the pump controller is adapted to change the speed of the pump in relation to a pressure of the gas in the chamber.

67. (Previously Presented) An apparatus according to claim 65 wherein the pump controller is adapted to change the speed of the pump to closely approximate the shape of a portion of a condensation curve of pressure versus time.

68. (Previously Presented) An apparatus according to claim 67 wherein the pump controller is adapted to change the speed of the pump to closely approximate a smoothly changing portion of the condensation curve.

69. (Previously Presented) An apparatus according to claim 65 wherein the pump controller is adapted to change the speed of the pump a plurality of times.

70. (Previously Presented) An apparatus according to claim 65 wherein the pump controller is adapted to change the speed of the pump in a continuous manner.

71. (Previously Presented) An apparatus according to claim 65 wherein the pump controller is adapted to change the speed of the pump by adjusting a rotational speed of an evacuating member of the pump.

72. (Previously Presented) An apparatus according to claim 65 further comprising a pressure gauge to measure a pressure of the gas in the chamber and provide a signal

to the pump controller and wherein the pump controller changes the speed of the pump in relation to the signal.

73. (Previously Presented) An apparatus according to claim 65 wherein the pump comprises an inlet connected to the chamber for evacuating the gas in the chamber and an outlet that exhausts the evacuated gas to atmospheric pressure.

74. (Previously Presented) An apparatus according to claim 65 wherein the pump operates at less than about 10,000 rpm.

75. (Previously Presented) An apparatus according to claim 65 wherein the chamber comprises a load-lock, transfer or process chamber.

76-83. (Canceled)

84. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

(a) a chamber capable of holding a substrate and processing the substrate in a gas;

(b) a pump capable of evacuating a gas from the chamber, the pump being substantially absent a foreline between the inlet of the pump and the chamber and being capable of operating at different speeds; and

(c) means for changing a speed of the pump from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate to control the rates of evacuation of the gas to reduce condensation of moisture in the chamber.

85. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump in relation to a pressure of the gas in the chamber.

86. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump in relation to a shape of a portion of a condensation curve of pressure versus time for the gas in the chamber.

87. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump to closely approximate a smoothly changing portion of the condensation curve.

88. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump a plurality of times.

89. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump in a continuous manner.

90. (Previously Presented) An apparatus according to claim 84 wherein said means changes the speed of the pump by adjusting a rotational speed of an evacuating member of the pump.

91. (Previously Presented) An apparatus according to claim 84 further comprising means for measuring a pressure of the gas in the chamber, and wherein said means changes the speed of the pump in relation to the measured pressure of the gas in the chamber.

92-101. (Canceled)

102. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

a chamber; and

a pump adjacent to the chamber, the pump having an inlet connected to the chamber to evacuate gas in the chamber and an outlet that exhausts the evacuated gas

to atmospheric pressure, the pump being substantially absent a foreline between the inlet of the pump and the chamber, the apparatus further comprising a pressure controller to control the pressure of the gas in the chamber by adjusting a speed of the pump.

103. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

a load-lock chamber comprising ~~[[and]]~~ an enclosure; and

a pump adjacent the load-lock chamber, the pump having an inlet connected to the load-lock chamber to evacuate gas from the load-lock chamber, the inlet being connected to the load-lock chamber and substantially absent a foreline, and an outlet that exhausts the gas to atmospheric pressure, the apparatus further including a pressure controller to control the pressure of the gas in the load-lock chamber by adjusting a speed of the pump.

104. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

a process chamber comprising a support and a gas distributor; and

a pump system comprising a pre-vacuum pump adjacent to the process chamber, the pre-vacuum pump having an inlet connected to the process chamber to evacuate gas from the process chamber and an outlet that exhausts the evacuated process gas to atmospheric pressure, the pre-vacuum pump being substantially absent a foreline between the inlet of the pump and the process chamber, whereby a substrate held on the support is processed by process gas introduced through the gas distributor into the process chamber, the apparatus further including a pressure controller to control the pressure of the processed gas in the process chamber by adjusting a speed of the pre-vacuum pump.

105. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

a chamber capable of holding a substrate and processing the substrate in a gas;
and

a pump having an inlet connected to the chamber via a foreline for evacuating gas in the chamber, the foreline having an internal surface area of less than about 0.4 m² for a length of less than about ~~[[3]]~~ 2 meters, the pump having an outlet that exhausts the evacuated gas to atmospheric pressure, the apparatus further including a pump controller adapted to control a rate of evacuation of the gas in the chamber by changing a speed of the pump.

106. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

a chamber capable of holding the substrate; and

a pump having an inlet connected to the chamber via foreline for evacuating gas in the chamber, the foreline having an internal surface area of about 0.4 m², for a length of less than about 2 meters, the pump having an outlet that exhausts the evacuated gas to atmospheric pressure, the apparatus further including a pump controller adapted to control a rate of evacuation in the chamber by changing a speed of the pump.

107. (Currently Amended) An apparatus for processing a substrate, the apparatus comprising:

(a) a chamber; and

(b) a high capacity pump adjacent to the chamber, the pump having an inlet connected to the chamber to rapidly evacuate gas in the chamber and an outlet that exhausts the evacuated gas to atmospheric pressure, the pump being substantially absent a foreline between the inlet of the pump and the chamber ~~having an operating rotational speed of not more than 12,000 rpm.~~

108. (New) An apparatus for processing a substrate, the apparatus comprising:

(a) a chamber capable of holding a substrate and processing the substrate in a gas;

(b) a pump capable of evacuating a gas from the chamber, the pump abutting the chamber and capable of changing its speed; and

(c) a pump controller adapted to provide a signal to the pump to vary the speed of the pump from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate to control the rates of evacuation of the gas in the chamber to reduce condensation of moisture in the chamber.

109. (New) An apparatus for processing a substrate, the apparatus comprising:

(a) a chamber capable of holding a substrate and processing the substrate in a gas;

(b) a pump capable of evacuating a gas from the chamber, the pump abutting the chamber and being capable of operating at different speeds; and

(c) means for changing a speed of the pump from a first pump speed at which the gas in the chamber is evacuated at a first volumetric flow rate to a second pump speed at which the gas in the chamber is evacuated at a second volumetric flow rate to control the rates of evacuation of the gas to reduce condensation of moisture in the chamber.

110. (New) An apparatus for processing a substrate, the apparatus comprising:

a chamber; and

a pump abutting the chamber, the pump having an inlet connected to the chamber to evacuate gas in the chamber and an outlet that exhausts the evacuated gas to atmospheric pressure, the apparatus further comprising a pressure controller to control the pressure of the gas in the chamber by adjusting a speed of the pump.

111. (New) An apparatus for processing a substrate, the apparatus comprising:

a load-lock chamber comprising an enclosure; and

a pump abutting the load-lock chamber, the pump having an inlet connected to the load-lock chamber to evacuate gas from the load-lock chamber and an outlet that

exhausts the gas to atmospheric pressure, the apparatus further including a pressure controller to control the pressure of the gas in the load-lock chamber by adjusting a speed of the pump.

112. (New) An apparatus for processing a substrate, the apparatus comprising:

a process chamber comprising a support and a gas distributor; and

a pump system comprising a pre-vacuum pump abutting the process chamber, the pre-vacuum pump having an inlet connected to the process chamber to evacuate gas from the process chamber and an outlet that exhausts the evacuated process gas to atmospheric pressure, whereby a substrate held on the support is processed by process gas introduced through the gas distributor into the process chamber, the apparatus further including a pressure controller to control the pressure of the processed gas in the process chamber by adjusting a speed of the pre-vacuum pump.